



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/517,601

12/22/2005

Dan Rico

2223-198

6670

1059 7590 01/22/2009

BERESKIN AND PARR
40 KING STREET WEST
BOX 401
TORONTO, ON M5H 3Y2
CANADA

EXAMINER

BITAR, NANCY

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

01/22/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/517,601	Applicant(s) RICO ET AL.	
	Examiner NANCY BITAR	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/21/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's response to the last Office Action, filed 6/30/2008, has been entered and made of record.
2. Applicant has amended claims 1, 5, 7-9, 12. Claims 1-12 are currently pending.
3. Applicants arguments filed 9/30/2008 have been fully considered but they are moot in view of the new ground(s) of rejection necessitated by the amendments. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Yaffe et al (US 4,638,502).

Examiner Notes

4. *Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner*

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samani et al (Biomechanical 3-D Finite Element Modeling of the Human Breast Using MRI Data) in view of Yaffe et al (US 4,638,502)

As to claim 1, Samani et al teaches a method of generating a three-dimensional breast thickness object for a digital mammogram of a breast, the method comprising:

(a) generating a phantom thickness object for transforming into the breast thickness object (a cubic agarose phantom with cylindrical inclusion was constructed and imaged using MRI, page 272 , 2nd L paragraph, figure 1b), the phantom thickness object being generated in a three-dimensional modeling means and being substantially breast-shaped and being generated providing an x-ray of physical phantom (breast image nonrigid registration, paragraph III.B);(b) determining a set of dimensions for the breast (table 1, page 276, see figure 2, breast boundaries in the TI meshing technique ; note that an MR image of an agarose phantom was acquired and corresponding FE meshes were created. Based on assigned elasticity parameters, a numerical experiment was performed using the FE meshes, and good results were obtained. The model was also applied to a breast image registration problem of a volunteer's breast, see abstract); and(c) transforming the phantom thickness object to conform to the set of dimensions to provide the

Art Unit: 2624

three-dimensional breast thickness object in the three-dimensional modeling means (based on the know geometry of the phantom a mesh was created, paragraph III, page 275-276). While Samani et al meets a number of the limitations of the claimed invention, as pointed out more fully above, Samani fails to specifically teach the providing an x-ray of a physical phantom. Specifically, Yafe teaches anthropomorphic breast phantoms, which were derived from conventional mammograms and which can reproduce those mammograms wherein the phantom is obtained, such as to relate radiographic density to material thickness in the radiographic environment used for obtaining the radiograph and over a range of densities comprising the density range of the radiograph, using the calibration data to translate the densitometric data defining the image into thickness data, and using said thickness data to form from the same material as the sample a three dimensional representation of the thickness data (column 3, lines 20-column 5 lines 60; figure 1 -3). It would have been obvious to one of ordinary skill in the art to produce the phantom thickness object using an x-ray mammogram s in Samani et al. breast image in order to factor out the imaging parameters particular to the examination to yield an accurate representation of the intrinsic anatomy that is ultimately what is relevant for diagnosis and increase the quality of the breast image. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 5, Samani et al teaches a computer program product for use on a computer system for analyzing digital mammograms, the computer program product comprising (a) a computer readable recording medium ;(b) phantom thickness object generation means recorded on the recording medium for instructing the computer system to generate the phantom

Art Unit: 2624

thickness object (breast image nonrigid registration, paragraph III.B);(c) data entry generation means recorded on the recording medium for instructing the computer system to upload a set of dimensions for the breast (see figure 2, breast boundaries in the TI meshing technique); and (d) transformation generation means recorded on the recording medium for instructing the computer system to transform the phantom thickness object to conform to the set of dimensions for the breast to provide the three-dimensional breast thickness object (based on the know geometry of the phantom a mesh was created, paragraph III, page 275-276). Brady teaches the phantom thickness object generation means recorded on the computer readable recording medium for instructing the computer system to generate the phantom thickness object, wherein the phantom thickness object is generated by providing an x-ray mammogram of a physical phantom breast (column 13, lines 8-47)

As to claims 2 and 6, Samani et al. in view of Yaffe et al, teaches the set of dimensions comprises a thickness readout for the breast and a size of the digital mammogram and wherein step (c) comprises normalizing a set of thickness values of the phantom thickness object based on the thickness readout for the breast; and, rescaling the phantom thickness object to the size of the digital mammogram (pages 275-276, III. B, Breast Image nonrigid Registration; see also Brady et al., figure 17).

As to claims 3 and 7, Samani in view of Yaffe et al, teaches a set of phantom landmarks at the edge of the phantom thickness object; determining a set of breast landmarks at the edge of the digital mammogram; and warping the phantom thickness object to map the set of phantom landmarks onto the set of breast landmarks. (edge detection, C, page 273; note that)

As to claims 4 and 8, Samani in view of Yaffe et al, Yaffe teaches the method as defined in claim 3 further comprising determining a second set of phantom landmarks on the phantom thickness object; estimating a breast density at a second set of points in the digital mammogram to determine a breast local thickness at the second set of point and a second set of breast landmarks corresponding to the second set of points; and warping the phantom thickness object to map the second set, of phantom landmarks onto the second set of breast landmarks (obtaining radiographic calibration data for material to be used for the phantom, such as to relate radiographic density to material thickness under conditions similar to those used for obtaining the radiograph of the object and over a range of densities comprising the density range of the object radiograph, using the calibration data to translate the densitometric data defining the image of the object into thickness data, and using said thickness data to form from the same material as the sample a three dimensional representation of the thickness data configured to overlay a radiographic image plane. The invention extends to phantoms produced by the above method, column 2, lines 13-56)

The limitation of claims 9-12 has been addressed above in claim 1-4.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

Application/Control Number: 10/517,601

Page 8

Art Unit: 2624

/Nancy Bitar/

Examiner, Art Unit 2624